

ARC turbo

Operating Manual

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USER NOTICE

The information that is contained in this manual is preliminary in nature. The American Research Corporation reserves the right to change the specifications for this system, the operating functions of this system, the information, and the documentation contained with this system without any prior notification to the user.

FEDERAL COMMUNICATIONS
COMMISSION
RADIO FREQUENCY
INTERFERENCE STATEMENT

Warning: The equipment described herein has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only those peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limitations may be attached to the computer. Operation of the computer system with non-certified peripherals is likely to result in possible interference to radio and/or reception. If peripherals not offered by the manufacturer are used with this equipment, we recommend that shielded, grounded cables with in-line filters be used.

INSTRUCTIONS TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, the reference and service manuals included with this system, it may cause interference to radio and/or television reception. This system has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential installation.

The American Research Corporation is licensed and recognized by the Federal Communications Commission as a manufacturer of Class B Computing Devices:

FCC NO. E215PVSYS-4-751

If this equipment does cause interference to radio and/or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- * Reorient the position of the receiving antenna.
- * Relocate the equipment with respect to the receiver.
- * Move the equipment away from the receiver.
- * Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.
- * Make sure that all card mounting screws, attachment connector screws, and ground wires are tightly secured.
- * Verify that the covers for the card slots are securely in position, if there are no cards installed.
- * If peripherals that are not offered by the manufacturer are used with this equipment, it is suggested that you use shielded, grounded cables with in-line filters.

Consult your dealer service representative for additional operating and system set up information. The manufacturer of this system is not responsible for any radio and/or TV interference caused by unauthorized factory modifications or revisions to this equipment. It is the responsibility of the user to correct such interference.

CAUTION

The manufacturer of the product described herein recommends that this product be used with a ground plug to ensure user safety. It should be used in conjunction with a properly grounded power receptacle to avoid possible electric shock. Before operating your PC system, please verify the correct voltage for your system. The manufacturer of this equipment is not responsible for any damage incurred in the operation of this system if the correct operational voltage is not used during system operations.

Note

START

START

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PREFACE

Chapter 1

THE ARC TURBO PC SYSTEM

This section provides a description of the ARC Turbo PC System, in particular the functions and operations of the components making up the PC System: the System Unit, keyboard, floppy diskette, and hard disk drives. Information is also provided on a cursory level to guide you through the basic operating procedures of your PC System. For more detailed information, refer to the MS-DOS User's Guide version 3.1 or higher.

Chapter 2

INSTALLATION OF PC OPTIONS

This chapter covers the basic concepts behind the installation and setup of the ARC Turbo PC System and required option cards. Additional information is also given to explain the procedures necessary to safely and securely transport your system for either short and/or long distance moves.

THE ARC TURBO PC SYSTEM

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1.1 THE PC SYSTEM

The system that you have just purchased is known as the American Research Corporation (ARC) Turbo PC. The components of the ARC Turbo PC System (keyboard, System Unit) and the instructions that are necessary to use the system are contained in one box. The System Unit is the CPU (Central Processing Unit), or the heart of your PC System. It is through the System Unit that all commands, instructions, and operations will be processed. The System Unit controls the operations of your system through a set or a series of instructions called a program. The System Unit also contains any option cards that may be required to operate your system. Connections on the rear panel of the System Unit allow you to connect and interface the System Unit with the other components of your PC System, such as the keyboard, the system display monitor (either color or monochrome), printer, or communications equipment.

The keyboard of your PC System contains 98 different keys. The keyboard is the interface device for your system that allows you to communicate with the operating system software. Without the keyboard, it would be virtually impossible to operate a data processing, a word processing, or a special software package with the PC System.

1. Before you begin to remove the system components from the shipping carton, you should visually check the physical condition of the shipping carton. Please take note of any physical damage or irregularities to the carton. If the physical condition of the shipping carton does not indicate any damage, go on to Step 2. Exterior damage to the shipping carton may indicate that the contents of the carton may also be damaged. If any damage is found, DO NOT remove the components from the carton. Contact the service center where you purchased your system for further instructions. If you do open a damaged carton, the service warranty for your PC System could be voided.
2. After completing the visual check of the shipping carton for your PC System, you may now begin to set up your system. You will need the following items in order to set up your system:
 - a. One Phillips screwdriver.
 - b. One flat-bladed screwdriver.
 - c. A suitable work area to set up your PC System.
 - d. A ground plug for the System Unit power cable. You also may need additional ground plugs for any components of your system (e.g. display monitor, printer, etc.).

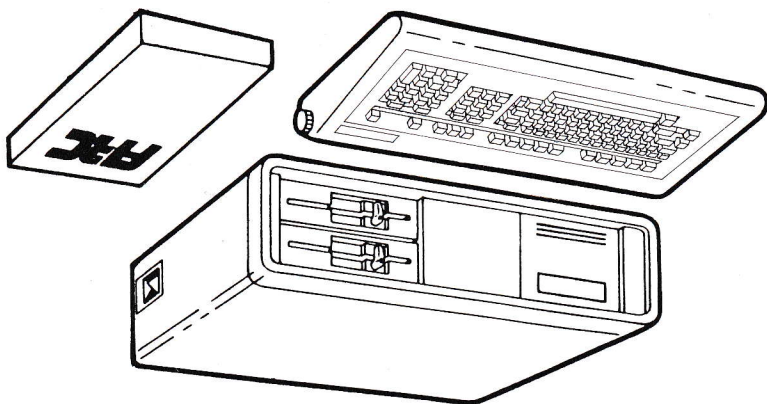
- e. A suitable power receptacle for use by your PC System. The American Research Corporation recommends that only the PC System use this power receptacle to avoid possible interference by electrical appliances or other external power sources.

- f. One box of 48 TPI Double Sided Single Density (DSSD) diskettes for use with your system.

- 3. Remove each component of your system from its shipping carton. Save the shipping carton, as you may need it later to move your system. Please be sure to take note of the warranty card that is included in the shipping carton with your System Unit. Be sure to fill in the required information and return the warranty card to the address indicated on the card. Your ARC PC System has a ONE YEAR service WARRANTY that cannot be acknowledged until the American Research Corporation or one of its authorized agents has received your warranty card.

- 4. Place each component of your PC System on the desk or table that you have designated as your work area.

Figure 1 The ARC Turbo PC System



6. The figure diagram below indicates the components that make up your PC System.
5. The American Research Corporation suggests that as you start to set up your system, you try to keep the system in a relatively dust and static free environment. Excessive exposure to dust, static electricity, direct sunlight, extreme cold, and water can damage the operational capabilities of your PC System.

7. The figure diagram below shows the rear panel of the System Unit and indicates the location of each interface connection on the rear panel.

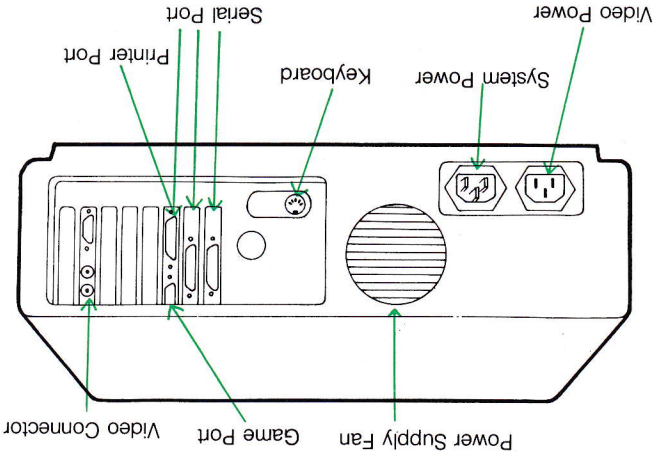


Figure 2 System Unit Rear Interface Panel

8. The figure diagram below shows the floppy diskette drives that are used with your PC System.

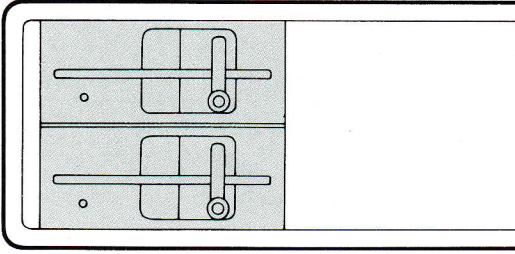


Figure 3 System Unit Floppy Diskette Drives

9. The following list indicates the various configurations that are available for the ARC TURBO PC. All ARC TURBO PC Systems contain 640 KB of RAM (Random Access Memory) as the standard memory configuration.
- * ARC TURBO PC with two (2) 5¼ inch Half-height Floppy Diskette Drives.
 - * ARC TURBO PC with two (2) 5¼ inch Half-height Floppy Diskette Drives and one (1) 10 MB Winchester Hard Disk Drive.
 - * ARC TURBO PC with two (2) 5¼ inch Half-height Floppy Diskette Drives and one (1) 20 MB Winchester Hard Disk Drive.
10. The following items are standard add-on devices for the ARC TURBO PC.
- * 7-PLUS Multifunction Card
 - * RAMDISK and SPOOL PLUS (Software Enhancement Modules)

11. With each component of your PC System, you will find an interface and/or power cable. The System Unit has a power cable. One end is attached to the System Unit and the other end is attached to the power outlet. The keyboard has a coiled six (6) foot, telephone like, cable that attaches to the keyboard interface jack located on the rear panel of the System Unit. The system monitor (either monochrome or color) should have two cables: an interface video connection cable and a power cable. One cable attaches to the rear of the System Unit, while the other cable can be attached either to the rear of the System Unit or your local power source.

12. Before powering on your ARC TURBO PC System, we recommend the following steps be performed:

Verify that your local power source is within the operating levels for your PC System. You can plug an electrical appliance (e.g. radio, desk lamp, etc.) into the outlet to check this. Also, check the voltage setting for your PC System. If it is not possible to determine the correct voltage setting for your area, contact either your place of purchase or your local power company for this information.

13. If you have determined that all of the required cards have been installed in your System Unit, then you should be ready to power on your PC System. If these cards have not been installed in your System Unit, then refer to the Hardware Installation section of this manual before continuing. **DO NOT** power on your System Unit if the required cards for the system have not been installed.
 - a. Verify that all cable connections for your System Unit and the components of your PC System are installed and connected correctly.
 - b. The System Unit Power Switch is located on the right rear side of the System Unit. Normally, the switch should be down in the OFF position. Before plugging the System Unit power cable into the power receptacle, make sure that this switch is in the OFF position.
 - c. The location of the power switches for other components can be found in the operating or user's guide for each of these components.

- d. Once power is applied to your PC System, a red LED (light Emitting Diode) on the keyboard will light up. This LED is located on the lower left side of the bottom key row on the POWER keycap. The bottom key row contains the SPACEBAR key. Make sure that you have loaded the correct software diskette in your Floppy Diskette Drive. If your PC System contains a Hard Disk Drive, you will first have to start your system from the Floppy Diskette Drive. Refer to the MS-DOS User's Guide for further information on how to format and copy software onto your Hard Disk Drive.

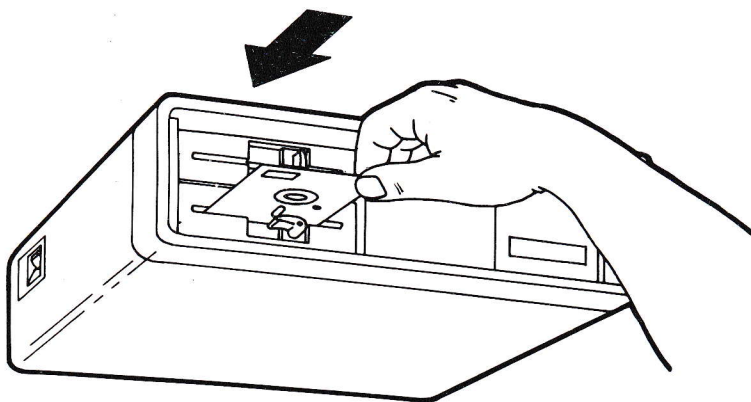


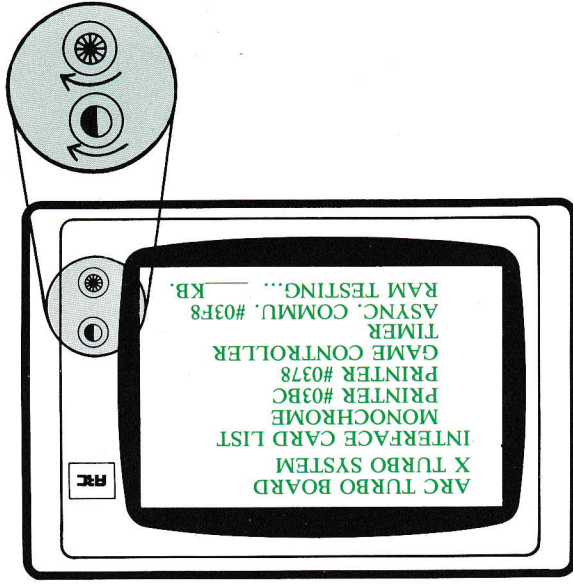
Figure 4 Loading a Diskette

1. Be sure that all power to your system unit is **Off**.
2. Turn the locking mechanism of the diskette drive counterclockwise to open Diskette Drive A so that you may load your diskette.
3. To load a diskette into the diskette drive, place the diskette as shown in the figure diagram below and move the locking mechanism down in a clockwise direction.

1.2 USING YOUR ARC TURBO PC SYSTEM

4. The power, brightness, and contrast controls should be located on the front of your system monochrome or color monitor. If the controls are not located on the front of the monitor, refer to the operations or user manual for your particular monitor. Turn the contrast and brightness controls clockwise to control the brightness and contrast of the display resolution. Make sure the power control has been turned on before you begin to adjust the brightness and/or contrast controls on your monitor. The resolution of the display monitor should be adjusted for optimum user comfort.

Figure 5 PC System Monitor



5. Power on your system unit.
- The following screen display will appear on your monitor when power has been applied to the System Unit. An audible tone will be issued by the system to indicate that it is starting the Power On Self Test. The Power On Self Test is a diagnostic test that is run automatically and internally by the system. Starting your PC System with a COLD START will initiate this test. Starting the PC System from a WARM START mode by-passes the self test. The Self Test checks the operating functions of your system hardware, such as disk drives, the system's on board memory, display monitor, and keyboard functions. This test will indicate the results of the test on your display screen. This test normally takes 30 to 90 seconds to run, dependent on the system configuration that you have chosen.

The following display will appear when the system is COLD STARTED.

ARC TURBO BOARD
X TURBO SYSTEM

INTERFACE CARD LIST

MONOCHROME

PRINTER #03BC

PRINTER #0378

GAME CONTROLLER

TIMER

ASYNC. COMMU. #03F8

RAM TESTING... KB (This
number will increase to 640 KB as the
system verifies all on-board RAM).

6. Below is the first display the system will indicate prior to accessing the operating system software.

AMERICAN RESEARCH CORP.
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VERSION 1.23 6/27/85

The following message will be displayed if you have not loaded any software into your diskette drive or the drive is not in a ready state.

INSERT DISKETTE IN DRIVE A
PRESS ANY KEY

7. After you have pressed any key on the keyboard, the system will request the date and time. Entering the current date and time allows you to keep track of all data and information that you enter. If you wish, the date and time entry can be by-passed by pressing the RETURN key.

CURRENT DATE IS TUE 1-01-1980
ENTER NEW DATE: MM-DD-YY
CURRENT TIME IS: 0:01:12.33
ENTER NEW TIME: 0.00.00.00

8. The system will indicate the particular operating system version when the date and time requests are displayed by the system.

The ARC XTURBO PERSONAL COMPUTER MS-DOS VERSION 3.10

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(C) Copyright MICROSOFT 1981, 82, 83, 84,
85

MICROSOFT MS-DOS VERSION 3.10
(C) COPYRIGHT MICROSOFT CORP.,
1981, 1982, 1983

9. When the default drive prompt, A >, message is displayed, it indicates that the PC System has loaded the system software from Diskette Drive A. The default drive prompt designation can be changed very easily by entering the designation of the new drive, followed by a colon (:). For example, to change the default drive from A to B, enter the following:

A > B: (Press RETURN)
B >

The system has recognized Diskette Drive B as the current system default drive.

For further information on the MS-DOS Operating System, refer to your MS-DOS User's Guide, version 3.1 or higher.

1.3 THE PC SYSTEM KEYBOARD

The PC System keyboard has been arranged into three areas of operation: the typewriter keys, the function keys, and the numeric keypad. Three LED (Light Emitting Diodes) status lights indicate the operating status of the Caps (Capital) Lock, Num (numeric) Lock, and the Scroll Lock keys. A fourth LED status light indicates that power to the keyboard is on. Refer to the figure diagram below for the location of the three key areas.

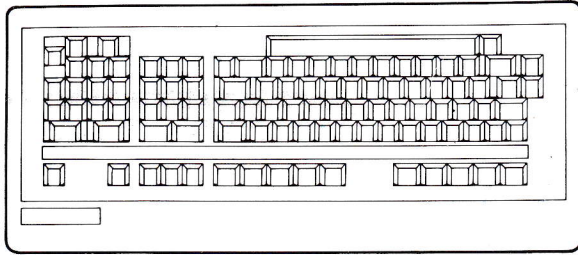
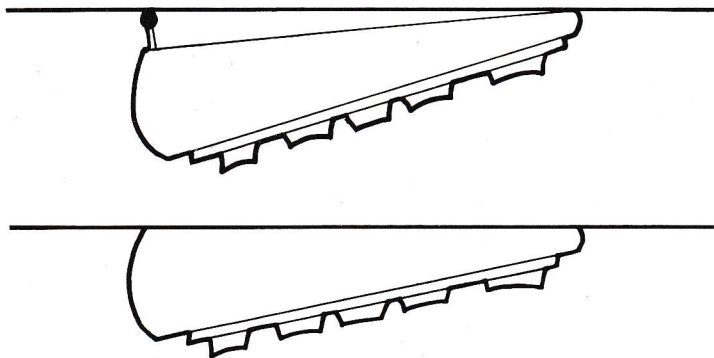


Figure 6 PC System Keyboard

Figure 7 Adjusting the Keyboard

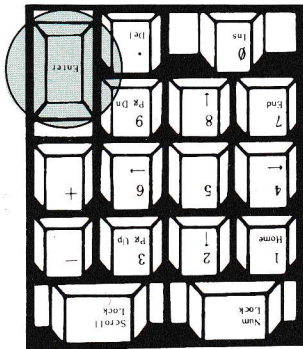


The keyboard can be adjusted to two different working positions for maximum user comfort. Located on the underside of the keyboard in the upper left and right corners of the keyboard are two feet. These feet can be pulled out or pushed in to either raise or lower the keyboard for maximum user comfort.

1.3.1. ADJUSTING THE KEYBOARD

- * When entering data or information into your computer, you should know that the zero (0) key and the capital letter O (oh) key can not be interchanged.
- * Also, the number one (1) key and the lowercase letter "l" (el) key are similar to the zero (0) and the capital letter O (oh).

Figure 8 The ENTER Key



This key, located on the lower right side of the numeric keypad, is similar in function to a carriage return. Each time it is pressed, it moves the cursor to the start of a new line. The Enter key is used to instruct the computer to accept instructions or to display information.

The ENTER key

The keys of the PC keyboard are similar to those found on a standard office typewriter. Most keys can repeat the same character by continuously pressing down each key as needed. Other keys located on the keyboard can perform certain control functions. These functions depend on the particular program that is being run.

1.3.2 TYPEWRITER KEYBOARD FUNCTIONS

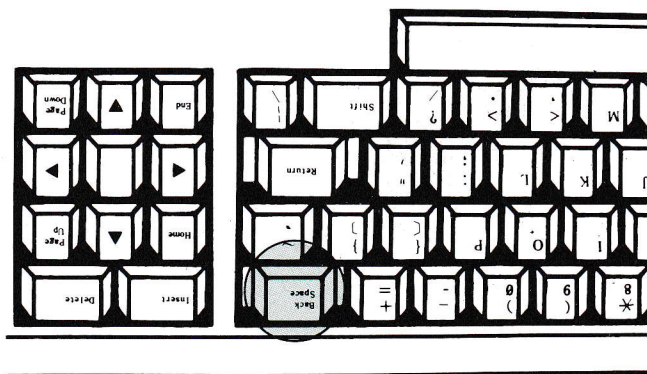
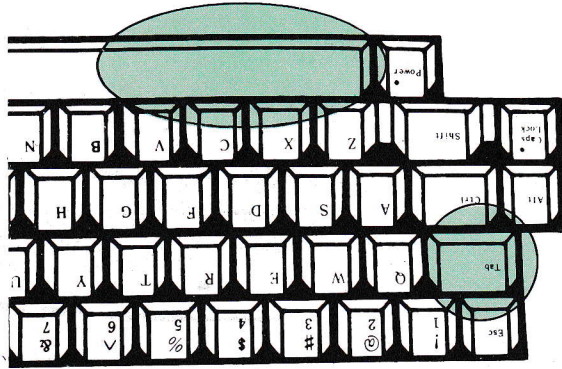


Figure 9 The BACKSPACE Key

The key can move the cursor back one key position to the left each time it is pressed. This function can be used to erase mistakes or to correct incorrect information that has been entered.

The BACKSPACE key

Figure 10 The SPACEBAR and the TAB keys



This key can be used to set required tab stops within a document and also set the format line. Each time this key is pressed, a tab will be placed in the document which corresponds to those tabs set on the document format line. This key can be used to set up columns, indent paragraphs and sentences, and arrange the format of a document page. This key can also be used with the SHIFT key to move the cursor left to the previous Tab stop.

The TAB key

This key is located in the center of the lowermost key row to the right of the POWER keycap. It can be used to move the cursor one position to the right. Each character that the cursor moves over is replaced by a blank space.

The SPACEBAR key

The SHIFT Key

Two SHIFT keys are located at either end of the bottom key row. The PC SHIFT key is similar to those found on a typewriter keyboard. Pressing either SHIFT key changes characters from lower case to upper case (Capital letters), from numbers to symbols, and those numeric keys found on the numeric keypad can be changed from cursor control keys to number keys. This last function is similar to activating the NUM LOCK key.

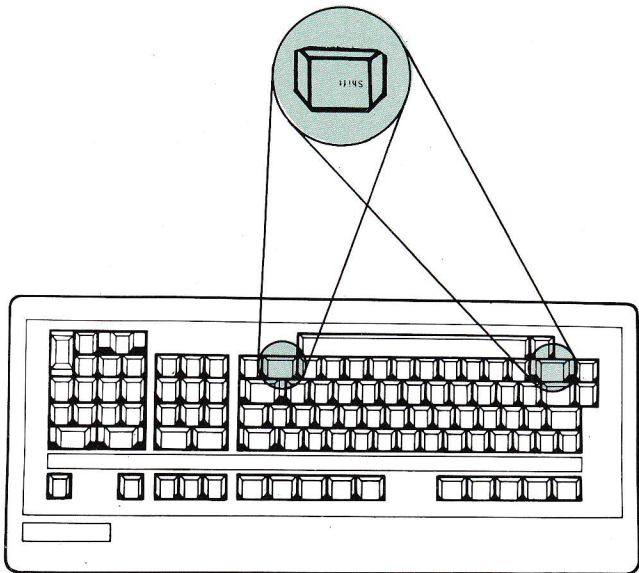
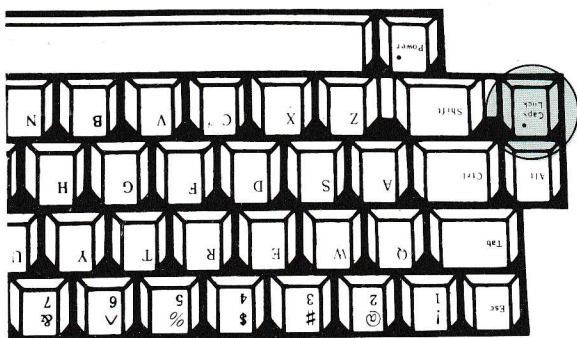


Figure 11 The SHIFT Keys

Figure 12 The CAPS LOCK Key



This key is located next to the letter A key on the home key row. This key works in the same manner as the SHIFT key. It is not necessary to press this key every time you want to enter capital letters (from A to Z). Once the Caps Lock key is pressed, a red LED on the CAPS LOCK keycap will indicate the Caps Lock mode has been activated. Pressing the Caps Lock key again returns the keyboard to its normal operating mode. If the CAPS LOCK mode has been activated and the SHIFT key is also pressed in conjunction with another key, the character displayed will be in lowercase mode versus uppercase mode. Those keys on the top key row will be in the uppercase mode if the SHIFT key is pressed when the CAPS LOCK key has been activated.

The CAPS LOCK key (Capital Lock)

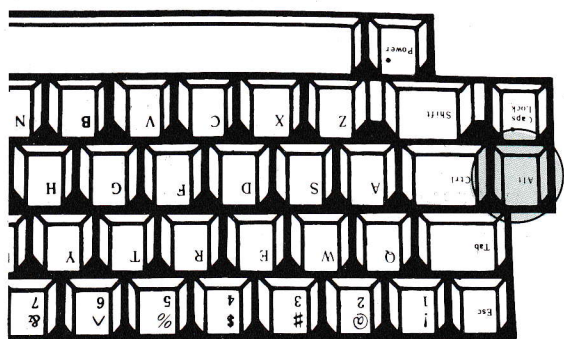
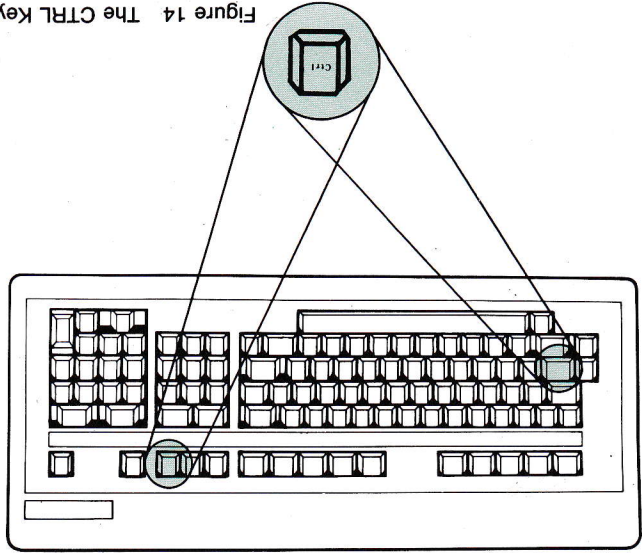


Figure 13 The ALT Key

This key is located to the left of the left SHIFT key on the bottom key row. This key can be used in conjunction with other keys to enter particular keywords more quickly instead of having to type in entire commands.

The ALT (Alternate) key

Figure 14 The CTRL Key



This key is located to the left of the CAPS LOCK key on the HOME key row (the middle key row). The key is always used with another key to perform a particular command or function. An example of a key function using the Alternate key is the system restart command. If you need to restart your PC System, it is faster to start the system with a warm start instead of a cold start. A cold start will use the system self test when power is applied to the System Unit, whereas with a warm start you are restarting the system without powering it off. Pressing the CTRL (Control) key and the ALT (Alternate) key and the DEL (DELETE) key will restart your system warm. Another CTRL key is located on the PF key row. This additional CTRL key has the same operational function as the key on the HOME key row. CTRL and ALT and DEL = Warm Start. The Alternate key can also be used to enter ASCII codes from the numeric keypad.

The CTRL (Control) key

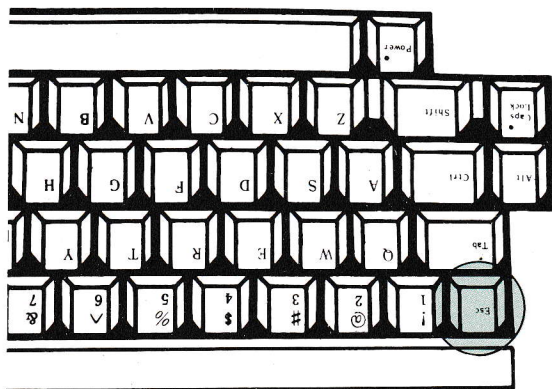


Figure 15 The ESC Key

This key can be used to cancel or escape from a command or function that you do not wish to use. Its functions are defined in your operating system or applications program manual. This key is located in the far left corner of the top key row.

The ESC (Escape) key

This key is located on the PF key row. This key is used to print out any information that is currently displayed on your display screen.

The PRT SC * (Print Screen) key

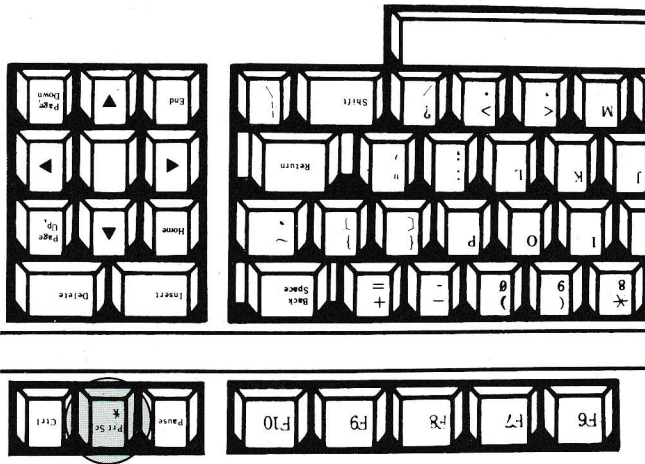


Figure 16 The PRT SC* Key

1.3.3 NUMERIC KEYPAD

The NUM LOCK (Numeric Lock) key

Pressing this key will alter the functions of the cursor control keys so they can be used as number keys instead of cursor control keys. The keypad is similar to a small calculator which can help to save you time when inputting many numbers. Pressing the NUM LOCK once more will return the operating functions of the numeric keypad keys 0 through 9 back to cursor control keys.

When the key is pressed or when your program is in the Number Lock mode, the NUM LOCK LED light will come on. When the key is pressed again or when your program is no longer in the Number Lock mode, the NUM LOCK LED light will go out. The NUM LOCK mode can also be activated by pressing the CURSR PAD (Cursor Pad) key, located on the same key row as the PF (Programmable Function) keys.

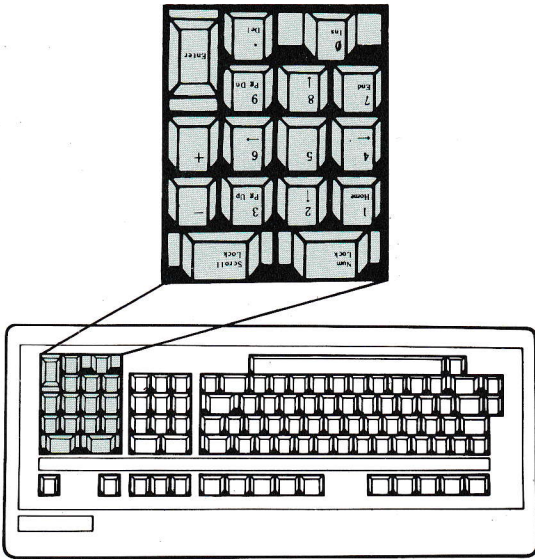
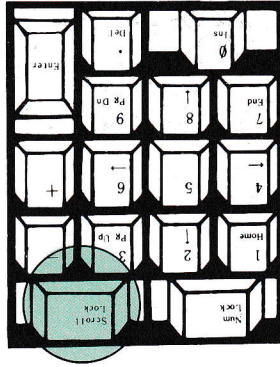


Figure 17 The NUM LOCK Key

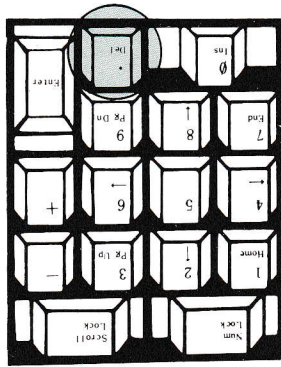
Figure 18 The SCROLL LOCK Key



This key is located on the top row of the numeric keypad in the right corner. Pressing the Scroll Lock key will cause the cursor up key (the number 8 key on the numeric keypad) and the cursor down key (the number 2 key on the numeric keypad) to move the text that is displayed on the screen up or down one line. The functions of the cursor up and cursor down keys, for example, are dependent on the particular applications package running on the system. The cursor will not be able to be moved from the current line it is positioned on until the Scroll Lock key is pressed again. The Scroll Lock key can also be used as a break key. The key can be combined with another control key on the keyboard to perform a particular function. For example, you can use the Scroll Lock key with the Control (Ctrl) key to stop or cancel a particular function or job. Refer to your operating system or applications program manual for more information on using the Scroll Lock.

THE SCROLL LOCK key

Figure 20 The DEL Key



This key will delete or erase every character that the cursor passes through. When a character is deleted, all data or text that is displayed on the screen will move one cursor position to the left for each character that is deleted.

The • (Decimal Point)/DEL (Delete) key

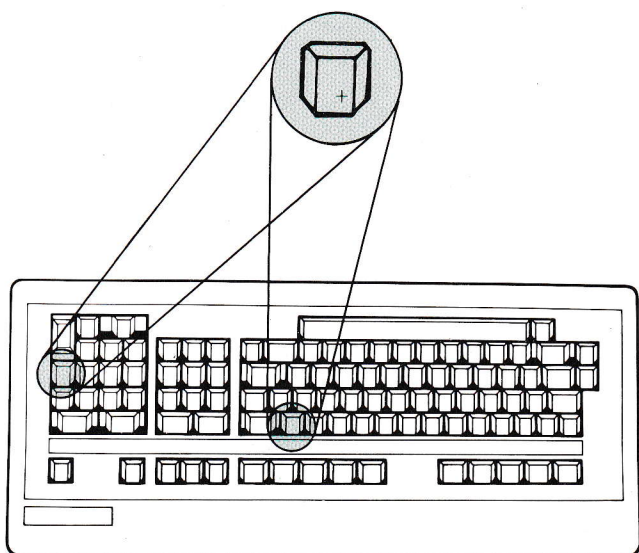


Figure 21 The PLUS Key

This key is located on the top numeric key row and is the uppercase = (equals sign). A plus (+) sign will be displayed on the screen each time this key is pressed. This key must be used with the SHIFT key to display a plus sign. The plus key on the numeric keypad can also be used.

The PLUS (+) key

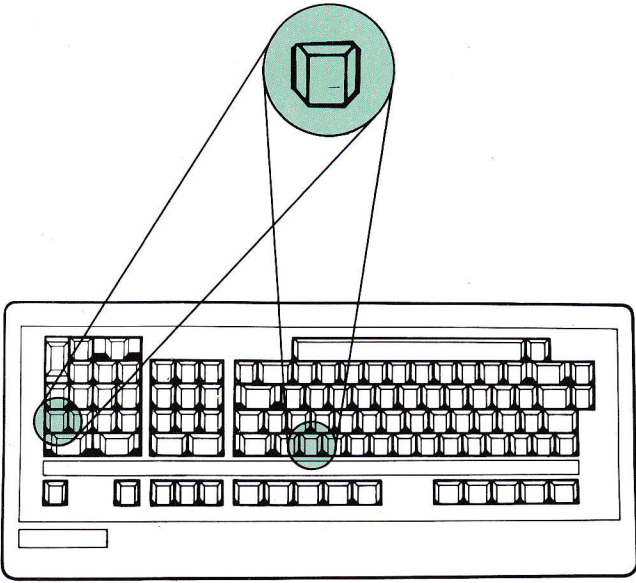


Figure 22 The MINUS Key

This key is located on the top numeric key row. A minus (-) sign will be displayed on the screen each time this key is pressed. This key is also found on the numeric keypad.

The MINUS (-) key

1.3.4 CURSOR CONTROL KEYS

The cursor is the blinking mark that indicates the current position of your next entry. The Cursor Control keys allow you to select the direction of movement for the cursor (UP or NORTH, DOWN or SOUTH, LEFT or WEST, RIGHT or EAST). Your keyboard contains two cursor pads. The one that is combined with the numeric keypad is operative in all operation modes, while the one to the left of the numeric keypad is operational only when the cursor Pad LED (Function Key) is ON, and is dependent on the application software running on the system. The keys on this keypad perform the same tasks as their counterparts on the Numeric Keypad.

- | | |
|---|--|
| 8 | The CURSOR UP key moves the cursor up one line each time it is pressed. |
| 2 | The CURSOR DOWN key moves the cursor down one line each time it is pressed. |
| 6 | The CURSOR RIGHT key moves the cursor to the right one position each time it is pressed. |
| 4 | The CURSOR LEFT key moves the cursor to the left one position each time it is pressed. |
| 7 | The HOME key moves the cursor to the top left corner (Home position) of your screen. |

- 1** The END key moves the cursor directly to the right of the very last character position on the page.
- 9** The PAGE UP key will change the current work page to the previous page each time it is pressed.
- 3** The PAGE DOWN key will change the current work page to the next page each time it is pressed.
- Pg Up**
- Pg Dn**

1.3.5 FUNCTION KEYS

Multi-purpose keys located on the topmost keyrow of your keyboard are known as Function Keys. There are ten of these keys and each key has its own particular function. Each key function will depend on the program that is being run.

Interpretive BASIC (GW-BASIC) is an example of one applications package that uses the function key. The following list explains the assignment of each key :

- F1** — LIST — This key will display the command "List" on your screen. Press the Enter key (which is located at the end of the home key row) to display the lines of your program.
- F2** — RUN — This key will start your program from the beginning.
- F3** — LOAD — This key is used to display the command "Load" on your screen. Enter the name of the program you want to run at the current cursor position. Press the Enter key to transfer your program from auxiliary memory and store it in main memory of your system unit.
- F4** — SAVE — This key will allow you to "Save" all the data that is displayed on your screen. Enter the name of the program that you are running and press the Enter key to store your program on your diskett or fixed disk.

- F5** **CONT** — This key allows you to restart or continue running your program after you have stopped the program or issued a pause command (CTRL - BREAK).
- F6** **LPT1** — This key will display "LPT1:" on your screen.
- F7** **TRON** — This key when pressed will display each line number of your BASIC program as it is run.
- F8** **TROFF** — This key will cancel the function of the F7 key. Pressing this key will cancel the display of line numbers on the screen as the program is run.
- F9** **KEY** — This key is used to issue commands through the Interpretive BASIC program to change the functions of other function keys within the program. After pressing this key, you must enter other key statement.
- F10** **SCREEN** — This key can be used to change or return the screen display from text to graphics mode or back again. It can also be used to turn off the color function of your color monitor.

1.3.6 MULTIKEY COMMANDS

The following are multikey sequences for control functions:

System Restart reloads your program.

Press and hold the Ctrl and Alt keys simultaneously. Then, press the Del key simultaneously to restart your system warm. CTRL and ALT and DEL = System Restart. CTRL and RESET = System Restart.

Control Break will usually stop the program that is running.

Press and hold the Ctrl key. Press the Scroll Lock key to issue a controlled break in your program. CTRL and SCROLL LOCK = Stop

Pause temporarily stops your program.

Press and hold the Ctrl key. Press the Num Lock key which will cause the program to pause. When you are ready to start running your program again, press any key to continue. CTRL and NUM LOCK = Pause (Wait State)

X-Turbo Mode will decrease the response time of your PC System during certain operating functions and programs.

Press and hold the Ctrl key and the Alt key together. Next press the - (minus) key on the numeric keypad. A red light on the front panel of the System Unit will light up to indicate that the X-Turbo Mode is activated. Performing the same steps again will allow you to exit from the X-Turbo Mode.

Clear Screen erases all information that is currently on the display screen and moves the cursor from its current position back to the upper-left corner of the screen (HOME position). Press and hold the Ctrl key. Then press the HOME Key to issue a clear screen command. CTRL and HOME = Clear Screen.

1.4 DISKETTES AND DISK DRIVES

A diskette is a magnetic disk contained within a protective plastic jacket. Diskettes are used by your PC system to store data. Generally, diskettes that are used for micro or personal computers are $5\frac{1}{4}$ inches in size. The storage capacity of each diskette will vary, dependent on the amount and type of data that is being stored, and the type of recording medium that is selected for the diskette.

Disk drives are devices that are used to read, write, and store data on disks. There are several types of storage devices available for use with your PC System: 5.25 inch 360 KB floppy diskette drives and 10 or 20 MB Winchester technology hard Disk drives.

One very important selection to make when using diskettes with your PC is the choice of the correct diskette. Do not use High Capacity diskettes with a Double Sided diskette drive.

Note: Before your diskettes can be used to store information, the diskettes must be made compatible to the diskette drives of your PC system. Formatting is the function that will allow you to use the diskettes on your system. Formatting is a function of the MS-DOS operating system. Remember, unless you first format your diskettes, the diskettes will not be compatible to your system to store information. For further information on the formatting function, refer to your DOS operating guide.

1.4.1 WRITE PROTECT

Write protecting a diskette prevents data and any other information stored on the diskette from being erased. This means that if you place a write protect tab on the diskette, no information can be added to the diskette until the write protect tab is removed. Always make sure to place a write protect tab on a diskette after you have finished copying or storing data and other information on the diskette. If the write protect tab is placed on the diskette before the format procedure is started, or before you wish to start storing data on the diskette, an error message will be issued by the system. This message indicates that because the write protect tab has been placed on the diskette, it is not possible to store any data on the diskette.

1.4.2 DISKETTE CARE

The diagrams below indicate the recommended steps to correctly store and handle your diskettes. These instructions will help to increase the operating efficiency of your diskettes and help reduce the risk of any data loss at a later date.

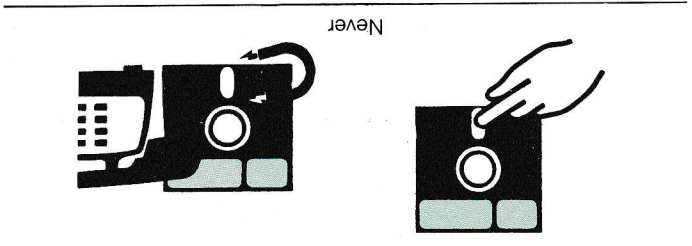
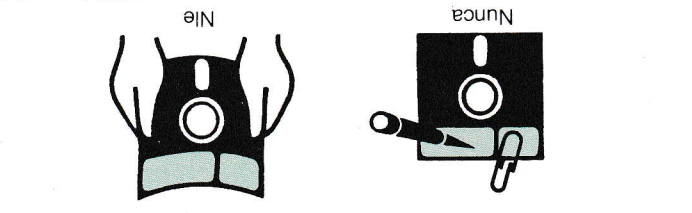
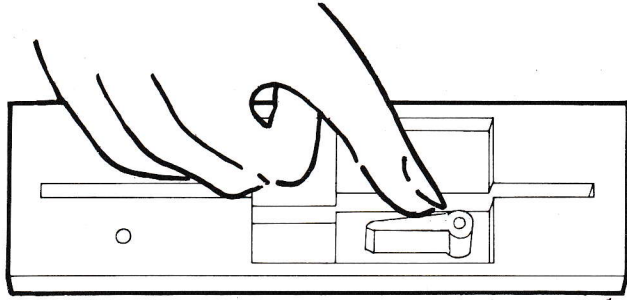


Figure 23 Care and Storage of Diskettes

2. Load the diskette into the diskette drive by following the arrows on the diskette label. In case there are no arrows on the label, the write protect diskette should be facing up and the write protect notch should be on the left side. Push the diskette all the way into the diskette drive, until there is an audible click to indicate that the diskette is loaded. Now lock the diskette drive by pushing the lever mechanism down in a clockwise direction until there is a click, indicating that the drive is locked.

Figure 24 Loading a Diskette



1. Rotate the drive mechanism lever on the diskette drive in a counterclockwise direction to open the diskette drive.

1.4.3 OPERATION OF THE DISKETTE DRIVE

3. A red LED light on the front of the diskette drive will come on when the PC System is accessing the information that is stored on the diskette, or when an operating function involving that diskette drive is being performed.
4. To remove a diskette from the diskette drive, simply perform the same steps for loading the diskette in reverse order. Always make sure that the red LED light is not on before you remove a diskette from the drive. Removing a diskette from a drive when the red LED is on may result in loss or damage to the data stored on the diskette and the diskette itself.
- a. Unlock the drive by turning the lever mechanism counterclockwise and remove the diskette. Now you can load another diskette into the diskette drive.

1.4.4 FORMATTING DISKETTES

The first function that should be performed with your PC system after you have completed the Hardware Installation and Setup is to format your floppy diskettes and hard disk drive. This function can be found in your DOS User's Manual. To format a floppy diskette, enter the command FORMAT after the MS-DOS prompt and if necessary, indicate the drive where the floppy diskette is located; either A or B.

A > Format B: (Press RETURN)

The system will respond to this command by displaying the message:

Insert new diskette for Drive B: and strike ENTER when ready (ENTER)

After you have loaded the desired diskette that you want to format into Drive B, the system will respond with the message; formatting. After the formatting process has been completed, the system will indicate that the diskette has been successfully formatted and ask if you want to format another diskette.

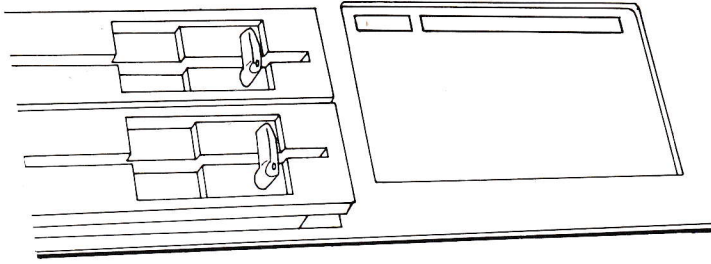
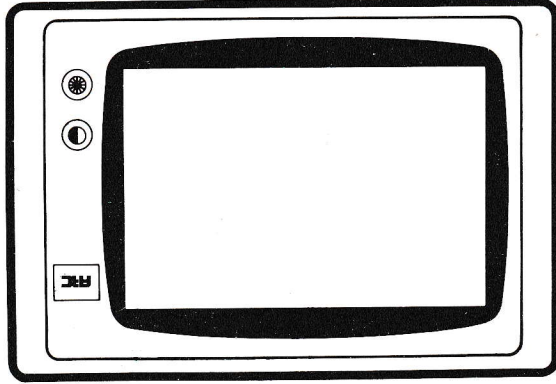


Figure 25 PC System Hard Disk

Using a hard disk drive with your PC system offers you the capability of storing a much larger amount of information than on floppy diskettes. Refer to the operating manual for your Hard Disk or your DOS Operating Guide for further information on Hard Disk directories. The size of a Hard Disk (10 MB or 20 MB) will also determine the amount of data that can be stored on the disk.

HARD DISK DRIVES

Figure 26 A Standard Monochrome Monitor



Always be sure to check the video and power cables for your monitor to make sure they are connected correctly to the system unit and plugged into a working power source before your turn on the power switch.

The Contrast control can be used to increase or decrease the quality and intensity of the resolution on your display screen. Turn the contrast control in a clockwise direction to increase the intensity of the brightness. Turn it counterclockwise to decrease the intensity.

The Brightness control can be used to increase or decrease the brightness of the entire display screen. Turn the control in a clockwise direction to increase the brightness and counterclockwise to decrease the brightness. Refer to the diagram below for further information.

MONOCHROME DISPLAY

1.5 DISPLAY MONITOR OPERATION

COLOR DISPLAY

When the power control on the color monitor is turned in a clockwise direction, power will be applied to the monitor. Turning the power control in a counterclockwise direction will power off your color monitor. This procedure may vary, dependent on the type and make of color monitor that you are using. If the power on procedure for your monitor differs from the one listed here, refer to your color monitor's operations manual before proceeding any further. Instructions on using the brightness and contrast controls for your color monitor are the same as the monochrome monitor. Again, if there is any difference, refer to your color monitor operations manual for further information.

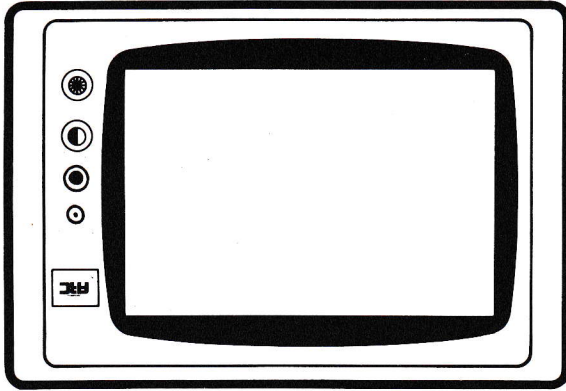


Figure 27 A Standard Color Monitor

VERTICAL HOLD ADJUSTMENT

1. Refer to this section if your monitor display is in a continuous roll condition. Some examples of a continuous roll condition might be caused by outside electrical interference, your monitor is located too close to your system unit, or the power cables that you are using are not shielded.
2. Refer to your monitor's operating manual for the location of the vertical hold control on your monitor. Turn the control in first a clockwise direction to see if the rolling condition stops. If the rolling does not stop, then turn the control in a counterclockwise direction until the rolling has stopped and the display is steady.

1. Adjustment of the vertical display on your monitor is necessary only if the size of figures and characters on the display are irregular.
2. Your system should still be powered off, so it is only necessary for you to power on your monitor. If your system is powered on, then power off everything except your monitor. Be sure the brightness and contrast controls on the monitor are turned as far as they will go in a clockwise direction.
3. Refer to your monitor operations manual for the location of the vertical display control. Turn the control in a counterclockwise direction. Once you start to turn the control, watch the display on your monitor for a black line which will be running across the top and the bottom of your display screen.
4. Begin to turn the vertical display control in a clockwise direction until the black lines at the top and bottom of the screen disappear. If both of these lines disappear, then your monitor should be working all right. If one or both of the lines do not disappear, continue to turn the vertical display control until they do.
5. It may be necessary at this point to adjust the brightness and contrast controls on your monitor display to acquire a more suitable display resolution.

VERTICAL DISPLAY ADJUSTMENT

Notes

INSTALLATION OF PC OPTIONS

INSTALLATION OF PC OPTIONS

Chapter 2

INSTALLATION OF PC OPTIONS

PREFACE

This section of the ARC Turbo PC Installation and User Guide is designed to enable you to easily set up your ARC Turbo PC and install all the necessary options for the system.

2.1 INSTALLING OPTIONS

System Unit Housing Removal and Replacement
This section will instruct you how to remove and replace the housing for your System Unit before and after installation of the options.

Option Installation

By following the instructions in this section, you can install the required options for your PC system:

* 7-Plus Card

* Color Graphics Card

* Monochrome Card

* Option Card Switch Settings

This section will instruct you how to set the correct jumper cables and pins required for each option card. Tables and figure diagrams will also instruct you how to select the correct option card Dip Switch setting.

2.2 SYSTEM UNIT HOUSING REMOVAL AND REPLACEMENT

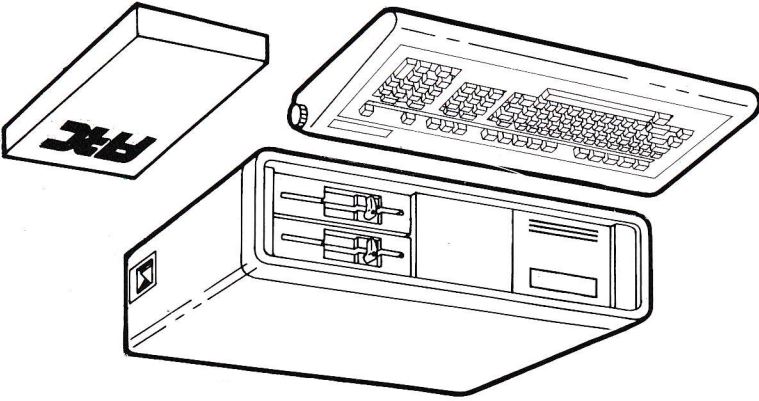
You can bypass this section if the housing for the System Unit has already been removed. If this is the case, refer to the installation section for instructions on installing your options safely and correctly. If the housing has not yet been removed, then continue with this section.

REQUIRED TOOLS AND OTHER EQUIPMENT

- * One medium sized, flat bladed screwdriver
- * One medium screwstarter
- * One $\frac{3}{8}$ -inch nutdriver
- * One $\frac{1}{4}$ -inch nutdriver

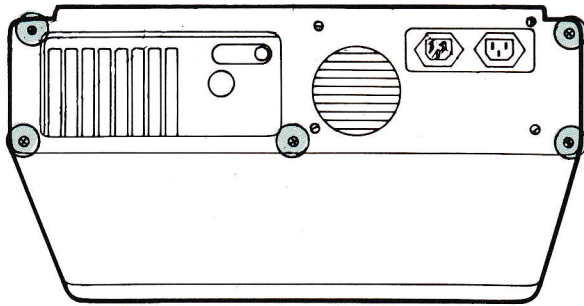
1. Make sure that all cables are disconnected from your System Unit and that the power switch is in the OFF position. Make sure to note the location of each cable connection before you disconnect them from the rear of the System Unit. Failure to comply with these instructions could result in physical damage to the System Unit and possibly personal injury to yourself.

Figure 28 PC System Unit



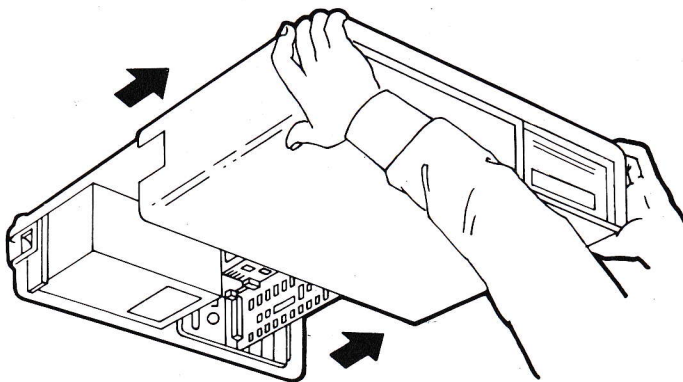
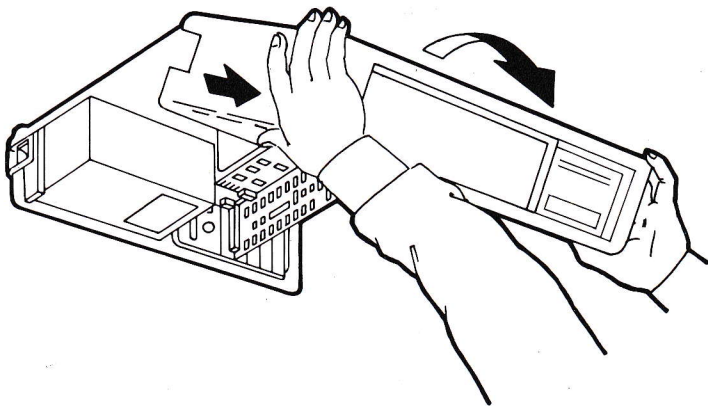
2. Refer to the figure diagram below for a clearer illustration of how to begin removing the housing of your System Unit.

Figure 29 Removing the Mounting Screws



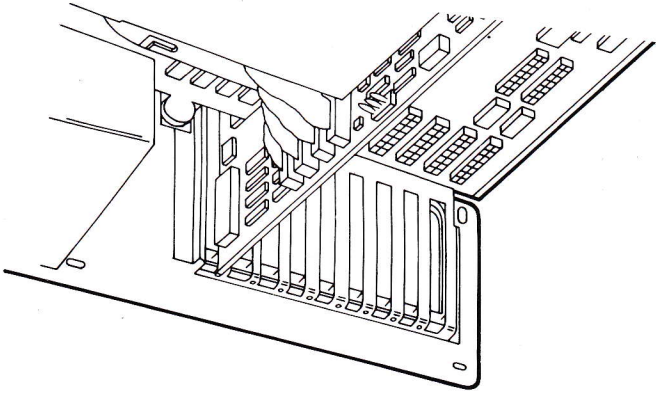
3. There are five (5) mounting screws located on the rear panel of the System Unit which must be removed. These five screws hold the housing of the System Unit to the chassis. Be sure to save these screws. You will need them later after your options have been installed and you are ready to replace the housing of the System Unit. Refer to the figure diagram below.

Figure 30 Removing the System Unit Housing



4. Remove the housing of the System Unit as shown in the figure diagram below by sliding the housing towards you. Slide the housing as far as it will go then tilt it up at approximately a 45 degree angle and remove it. After the housing has been removed, place it to the side. You may now begin to start installing your system's options.

Figure 31 System Unit Expansion Slots



5. After the housing for the System Unit has been removed, your System Unit should look similar to the figure diagram below. There are eight (8) expansion slots in your System Unit. The expansion slots hold the options that your system requires.

2.3 INSTALLING SYSTEM OPTIONS

This section explains all the necessary steps to correctly and safely install your system options. Options are installed in the expansion slots within the System Unit.

1. It is quite easy to inadvertently damage an option even before you have installed it in your System Unit. Options are quite fragile and can be damaged quite easily by static electrical discharge, even though there may be no visible sign of physical damage. Due care must be taken in handling the option to make sure that no static buildup is present which may damage it. To prevent electrostatic discharge from damaging your option, you should leave it in its anti-static bag until you are ready to install it. To ground out an option before installation, hold the option in one hand and place your other hand on any metal part of the System Unit chassis. Refer to the figure diagram below for further details.

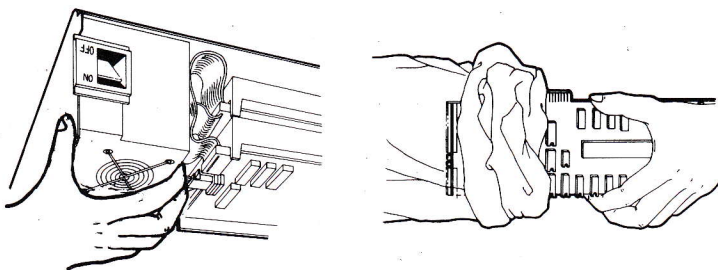
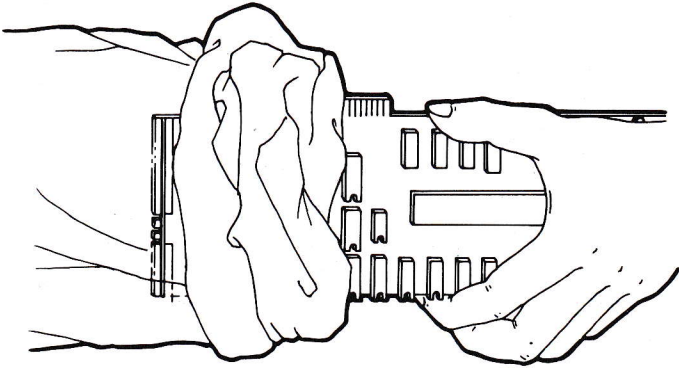


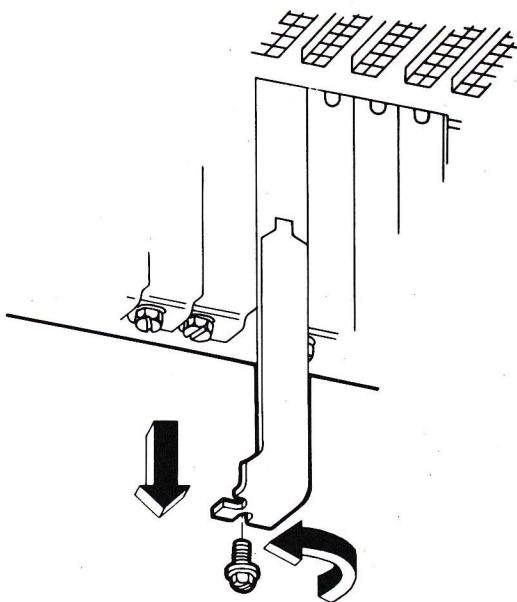
Figure 32 Grounding an Option

Figure 33 Correctly Holding an Option Card



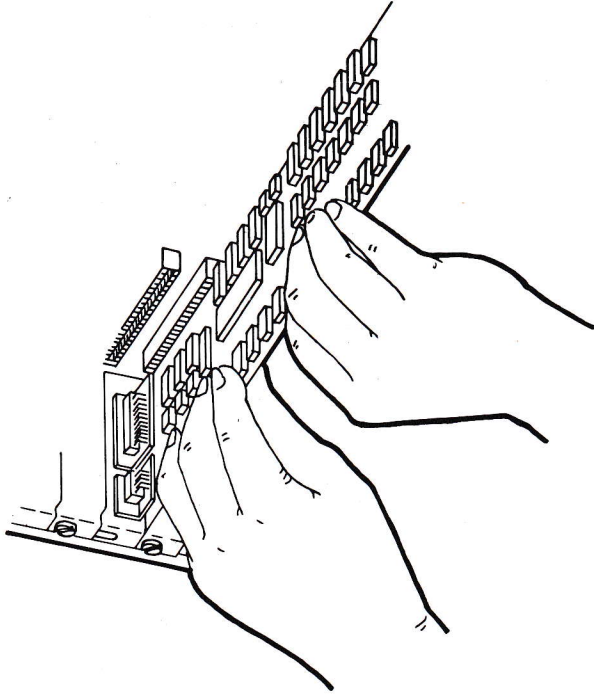
2. Care must be taken when you are ready to remove the option from its bag.
- Hold the option by its edges only. Be careful not to touch any of the components, contacts, or connections on the option, Oil, dust, dirt, or sweat from your hands can damage your option, so care must be taken when handling it.
- Hold all diskette and hard disk drives by their metal frames.
- Avoid touching the pins on all modules and connectors. Hold modules and connectors by their ends. Refer to the figure diagram for further information.

Figure 34 Removing the Expansion Slot Cover



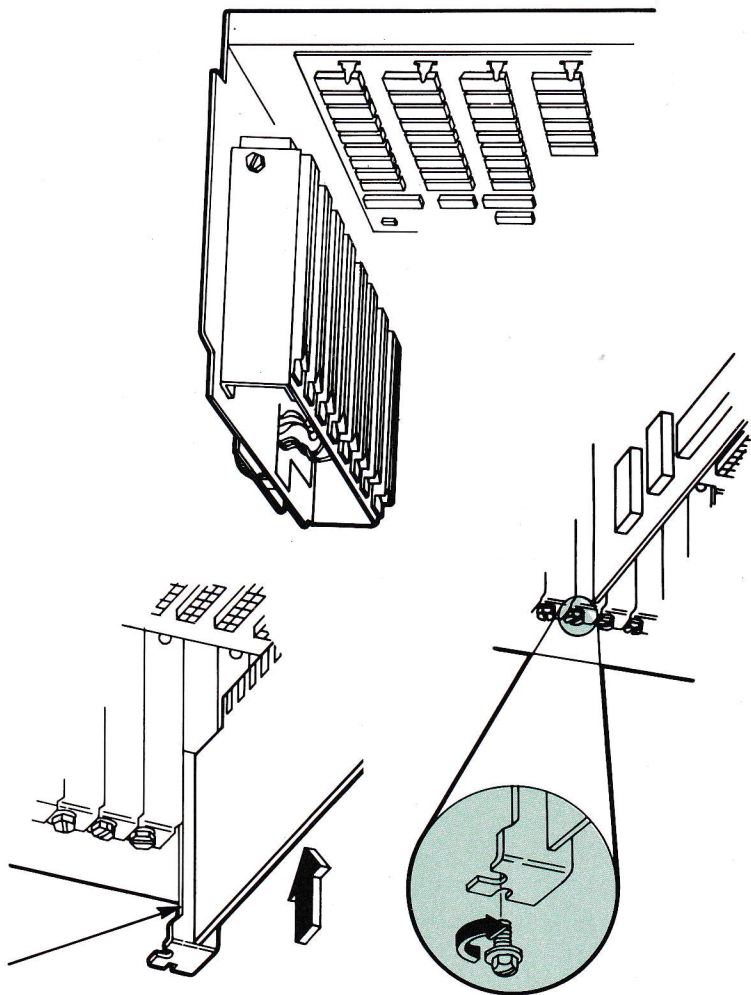
3. Most options can be installed in any available expansion slot, unless otherwise specified in the installation instructions for a particular option. The following instructions will guide you through the installation steps.
- a. The screw that holds the expansion slot cover in place should be removed and saved for later use.

Figure 35 Inserting an Option in Expansion Slot



4. When you are ready to install an option, hold the card by its top edge with the bottom edge inserted firmly into the supporting guide brackets for the expansion slot. Sometimes it may be necessary to remove adjacent options that have already been installed in order to install new ones. Make note of which ones you remove and from where, if it is necessary for you to remove any.

Figure 36 Replacing the Expansion Slot Cover



a. Now you may reinstall the screw that holds the expansion slot cover in place.

5. After the Expansion Slot Cover has been replaced, you should be ready to replace the housing for your PC System. Be sure that you do not pinch or cut any of the power or disk drives cables with the housing as you replace it. After the housing has been replaced, the retaining screws on the rear panel should be replaced. You should now be ready to reconnect the components of your PC System to the System Unit and begin operations with the system.

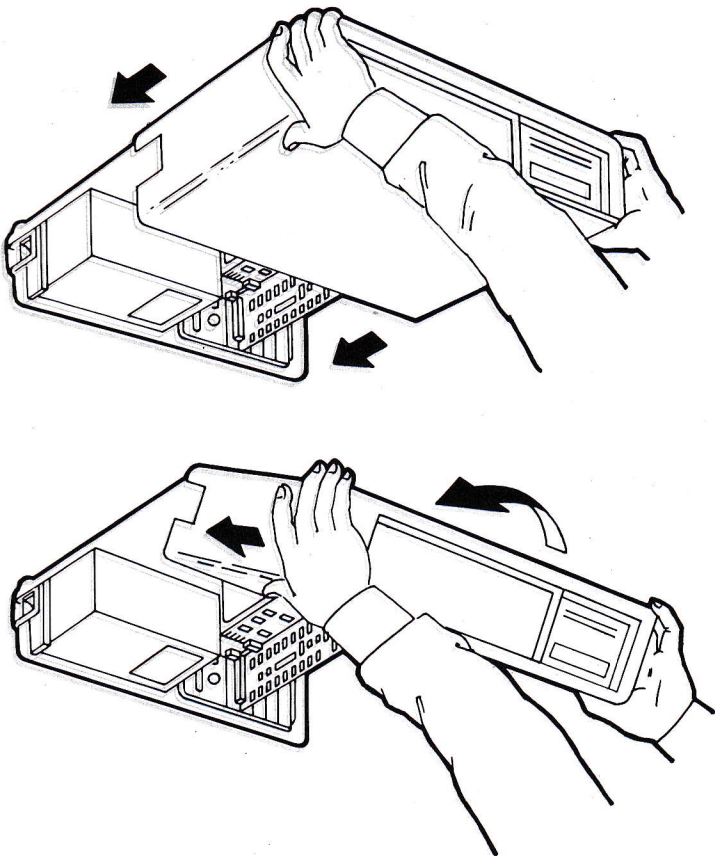


Figure 37 Replacing the System Unit Housing

2.3.1. SWITCH SETTINGS FOR OPTIONS

Once the required option cards for your PC System have been installed in the System Unit, you should be sure that there are no secondary installation requirements for a particular card. Secondary requirements can include such items as special dip switch settings, jumpers, cable, and pin connections. 1. This section will first discuss the necessary functions required to make the 7-PLUS Option functional.

The 7-PLUS is a multifunction option. A parallel printer port, a serial port, a clock/calendar, a game port adapter, and an optional FDC (Floppy Disk Controller) are all included in this option.

7-PLUS JUMPER IN SETTINGS

Be sure that the Jumper Pins are set and connected correctly. If there are any incorrect connections, these could effect the operations of some of your systems functions.

JUMPER	FUNCTION	JUMPER	FUNCTION
JP1	SERIAL PORT	CN1	FLOPPY DISK DRIVE
JP2	CLOCK	CN2	EXPANSION OF THE EXTERNAL DRIVE
JP3	PARALLEL PRINTER PORT		
JP4	SERIAL PORT	CN3	SERIAL PORT (PORT2)
JP5	PARALLEL PRINTER PORT	CN4	SERIAL PORT (PORT2)
JP6	PARALLEL PRINTER PORT	CN5	GAME PORT
JP7	CLOCK	CN6	PARALLEL PRINTER PORT

Figure 38 Jumper Pin Settings
* PCB NO. SW: 010886(2 layer)

RS-232 SW1

	ON	PRINTER PORT ENABLE
1	PRINTER PORT CONNECT TO IRQ7	PRINTER PORT DISCONNECT TO IRQ7
2	CLOCK PORT ADDRESS 240	CLOCK PORT ADDRESS 340
3	PRINTER PORT ADDRESS 378	PRINTER PORT ADDRESS 278
4	CLOCK PORT CONNECT TO IRQ2	CLOCK PORT DISCONNECT TO IRQ2
5	CLOCK PORT CONNECT TO IRQ3	CLOCK PORT DISCONNECT TO IRQ3
6	CLOCK PORT CONNECT TO IRQ4	CLOCK PORT DISCONNECT TO IRQ4
7	CLOCK PORT CONNECT TO IRQ5	CLOCK PORT DISCONNECT TO IRQ5
8	CLOCK PORT CONNECT TO IRQ6	CLOCK PORT DISCONNECT TO IRQ6
9	CLOCK PORT CONNECT TO IRQ7	CLOCK PORT DISCONNECT TO IRQ7
10		

NORMAL: 1, 2, 3, 4, 5 on, 6, 7 8, 9, 10 off

* PCB NO. SW: 010886(4 layer)

2.3.2 THE PARALLEL PORT

The 7-Plus has been designed with the specific purpose in mind of attaching it to printers with a parallel interface port. It can also be used as a general I/O port with any compatible system.

The printer port includes twelve (12) latched TTL buffer output points and five (5) steady-state input points. These points can be written and read under program control, using the processors in and out instructions.

A processor interrupt can be both effected and discontinued under program control.

The power-on circuit is ORed with a program output point to enable reception of a power-on reset, when the processor is reset.

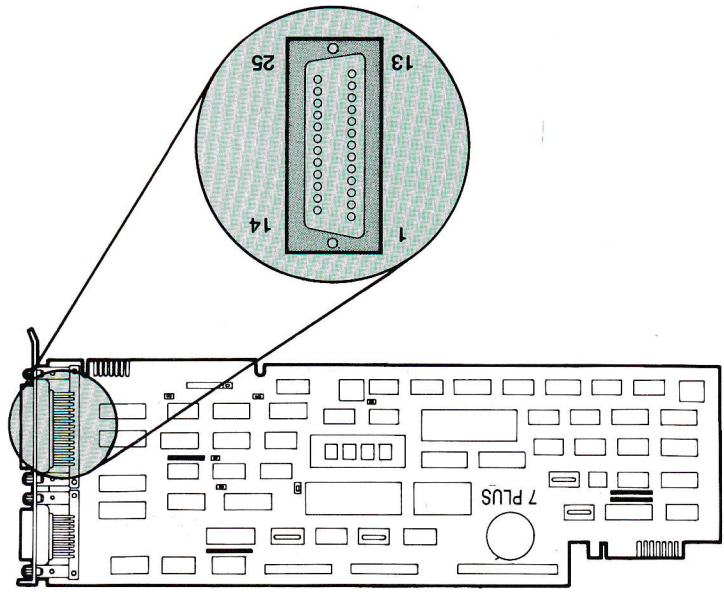


Figure 39 7-Plus Input/Output Signals

If the adapter (parallel printer port) is attached to a printer, you must load the data or printer commands into the 8-bit, latched, output port. This will activate the strobe line and the data will be written to the printer. Program control will read the input ports for printer status and indicate either when the next character will be written, or, using the interrupt line, indicate a "not busy" status to the system software.

2.3.3 THE SERIAL PORT

The 7-Plus serial port uses the industry standard EIA RS-232C communications interface port. The port is fully programmable for PC asynchronous communications and a programmable baud rate generator allows operations ranging from 50 to 9600 bps (bits per second).

The system contains five, six, seven, and eight bit characters, including 1, 1.5, or 2 stop bits.

Note: The 20 milliamper current loop interface option is not included in the asynchronous communications adapter. Diagnostic functions are available to provide loopback functions for transmit/receive and input/output signals.

Figure 40 Serial Port Jumper and Pin Settings

Pin Number	Signal
1	Carrier Detect
2	Receive Data
3	Transmit Data
4	DTE Ready
5	Signal Ground
6	Data Set Ready
7	Request Send
8	Clear to Send
9	Ring Indicator

The following table lists the RS-232-C signals used with the asynchronous communications adapter connectors.

*PCB NO. SW: 010886(4 layer)

1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1</
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RS-232 SW2

*PCB NO. SW: 010886(2 layer)

NOTE: 1*-DON'T CARE

JP1	JP4	INT REQUEST	ADDRESS	FUNCTION	PORT
1,2	1,2	IRQ4	3F8	COMM1	CN4(PORT1)
1,4	2,4	IRQ3	2F8	COMM2	CN4(PORT1)
2,3	2,3	*	*	DISABLE OF COMM1 (3F8)	CN4(PORT1)
2,3	1,5	IRQ4	3F8	COMM1	CN3(PORT2)
3,4	4,5	IRQ3	2F8	COMM2	CN3(PORT2)
*	5,6	*	*	DISABLE OF COMM2(2F8)	CN3(PORT2)

The serial port is an integral part of the DTE (data terminal equipment) and utilizes a 9-pin "D" shell connector (J1) located on the top right hand section of the board.

2.3.4 THE GAME PORT

The game port, a 16-pin, wafer connector, is located on the upper, right-hand corner of the 7-Plus option. Refer to the figure diagram below for further information.

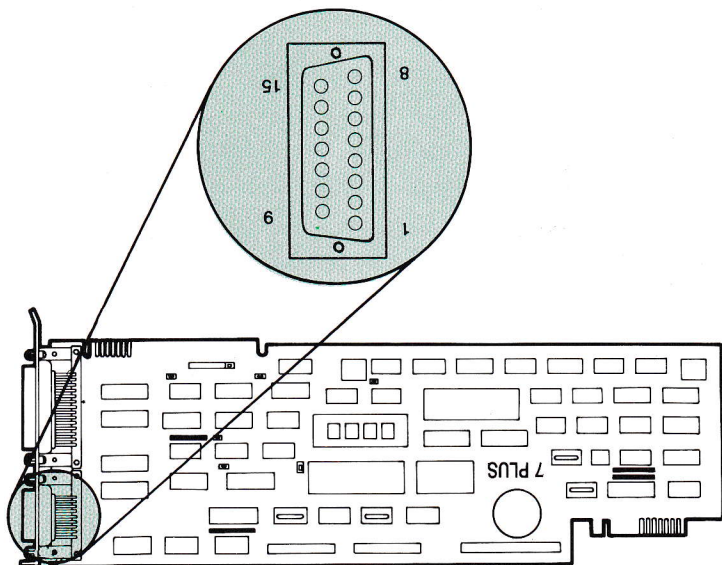


Figure 41 The Game Port

Enabling the game port involves utilization of a 16-pin connector, one end of which is attached to the 7-Plus, a 16-pin, wafer connector, and the other end which is attached to the 16-pin, D-shell connector located on the expansion slot cover.

2.4 RAMDISK PLUS

RAMDISK PLUS enables your PC System to operate from one to four floppy diskette drives of 20 to 360 KB capacity.

The following procedures will outline the steps necessary to install the RAMDISK PLUS package on your PC System correctly.

If your PC System already has two floppy diskette drives and one Hard Disk drive, we recommend the following designations for these drives:

Floppy Disk 1 - Drive A
Floppy Disk 2 - Drive B

Refer to the MS-DOS User's Guide for instructions on how to configure your PC System in the configuration just mentioned.

1. Power on your PC System with your MS-DOS Operating System Diskette Version 3.10 or higher loaded into Diskette Drive A.

2. After your PC System has been started under the MS-DOS Operating System, unload the DOS diskette from Drive A and replace it with the RAMDISK PLUS diskette. If your PC System contains two floppy diskette drives, you can simply change the default drive from Drive A to Drive B and load the RAMDISK PLUS diskette into Drive B.

3. The following DIP SWITCH settings must be selected if you are going to access the RAMDISK PLUS function.
 - a. If Drives A and B are already in use with your PC System, then you are probably loading the RAMDISK PLUS software into Drive C. Set the DIP SWITCH at position three. Refer to the figure diagram for further information.

DIP SWITCH SETTINGS

SWITCH DESCRIPTION

- 1 For normal operations, this switch must be OFF.
- 2 Coprocessor.
- 3-4 Amount of memory on the system board.
- 5-6 Type of display you are using.
- 7-8 Number of 5¼ inch diskette drives installed in your System Unit.

DIP SW 7 Position	DIP SW 8 Position	DRIVE NUMBER
ON	ON	1
OFF	ON	2
ON	OFF	3
OFF	OFF	4

Figure 42 RAMDISK Dip Switch Settings

4. Loading the RAMDISK PLUS software on Drive C can be accomplished simply by entering the following command:

Ramdisk C:

The screen display will be as follows:

Ramdisk - - V1.0 7-Plus software (C)

Copyright 1985.

This RAMDISK has a 171,008 Byte capacity.

5. It is now possible for you to use the RAMDISK as you would a normal floppy disk drive.

6. Enter the command **CHKDSK** to verify your system memory, RAMDISK and floppy disk.

7. To enable 80 KB memory in RAMDISK D, enter:

B: ramdisk d: /80

Screen Display will be as follows:

Ramdisk - 1.0 7-Plus software (C)

Copyright 1985.

This RAMdisk software contains 81,920 bytes.

2.5 SPOOL PLUS

SPOOL PLUS software enables you to utilize from 4 KB to 512 KB of memory as a printer buffer. The SPOOL Plus sends output to the printer while you execute your program, thus greatly improving your PC System's operating efficiency.

The following procedures will outline the steps necessary to install the SPOOL PLUS package on your PC System correctly.

1. Power on your PC System with your MS-DOS Operating System Diskette, Version 3.10 or higher. Load into Diskette Drive A.

2. After your PC System has been started under the MS-DOS Operating System, unload the DOS diskette from Drive A and replace it with the SPOOL PLUS diskette. If your PC System contains two floppy diskette drives, you can simply change the default drive from Drive A to Drive B and load the RAMDISK PLUS diskette into Drive B.

3. Assign the following printer buffer designation:
spool bpt 1: /

4. The following screen display will appear:

Spool - V1.0 7-Plus software (C)

copyright 1985.

A 65,536 byte buffer

5. It is now possible for you to utilize the functions of the Spool Plus package as you would a normal printer buffer.

6. In addition, you can set the Spool Plus to a buffer capacity of your own choosing.

Spool - V1.0 7-Plus software (C)

Copyright 1985

A 122,880 byte buffer.

2.6 The X TURBO BOARD

The X-TURBO Board that is used with your PC System is the System Board, or as it is sometimes referred, the motherboard for the System Unit. The X-TURBO can be divided into five (5) operating functions:

- a. Processor Subsystem and its support elements.
- b. Read-Only-Memory (ROM) Subsystem.
- c. Read/Write (R/W) Memory Subsystem.
- d. Integrated I/O Adapters.
- e. I/O (Input/Output) Slots.

* The basic operating difference between the X-TURBO and other system cards can be explained as an increase in computing power and speed for your PC System.

1. The required Dip Switch settings when the TURBO board is installed in your System Unit are listed below.
- WARNING:** Make sure the pins are carefully aligned into each connector as the pins can bend easily. If the pins are bent, it may not be possible to reinsert them again. If the modules are improperly inserted, the module and the system board may both be damaged. Visually check the modules to make sure they have been installed correctly in the proper direction and that the pins are not bent.
- Set the mode selector switch 1 to OFF to enable the system self test. If the switch is left ON, the system will be in Normal Mode.
- a. Care should be taken when selecting the correct Dip Switch setting. Make sure that all power to the System Unit is disconnected before you start. When setting the switches, please be careful as the switches can be damaged easily.
- b. For 640 KB of RAM set the switches to ON for even numbers and to OFF for odd numbers. Set Jumper J4 to the 640 KB position.
- c. For 256 KB of RAM set the switches to ON for odd numbers and to OFF for even numbers. Set Jumper J4 to the 256 KB position.
- d. For OK RAM set Jumper J5 to the OFF position.

- e. After all pins have been aligned on each module with the connector, press the nine 4164/41256 modules firmly into place.
- f. If your board contains an 8087 chip, switch 2 must be set to OFF to enable the microprocessor.
- g. Switches 3 and 4 should be set to OFF if your system contains 640 KB or 256 KB of RAM.
- h. If you are using a monochrome monitor with your system, switches 5 and 6 should be set to OFF. If you have an 80 by 25 color card, switch 5 must be ON and switch 6 must be OFF. If you have a 40 by 25 color card, switch 5 must be OFF and switch 6 must be ON.
- i. If your system is using four (4) drives, switches 7 and 8 must be OFF. Switch 7 must be ON and switch 8 must be OFF. If you are using three drives. For two drives, switch 7 must be OFF and switch 8 must be ON.

2.6.1 SETTING THE JUMPERS FOR THE X TURBO BOARD

1. J6 is a turbo setting jumper. The highest position for the jumper is normal speed, the medium position is Auto Turbo, and the lowest position is Soft Turbo.
2. J7 is a memory read/write wait cycle jumper. The highest position is Wait Cycle 4, the medium position is Wait Cycle 2, and the lowest position is Wait Cycle 0. This jumper works with low-speed memory devices.
3. Turning on the Soft Turbo Mode
 - a. Press and hold the CTRL and ALT keys simultaneously, while pressing the - (minus) key on the numeric keypad.
 - b. After the Turbo Mode has been activated, the cursor will change to a large flashing square. Simply repeat the procedure used to activate the Turbo Mode to return the system to the Normal Mode.

2.7 MOVING YOUR PC SYSTEM

1. When you are planning a move of your PC system, one of the first things to consider should be the safety and security of the data and other information that is stored on your system disks. For example, if your system contains a hard disk, all data on the hard disk should be backed up onto a floppy diskette before you move your PC system. The heads of the hard disk should be locked or parked in place to prevent any damage to the hard disk during the move.

2. Locking the read/write heads of the hard disk during your move can be accomplished by following the instructions listed in this section.

- a. Your MS-DOS system diskette will contain a file necessary to lock the heads of the hard disk: PARK.EXE. Simply load your MS-DOS

diskette into Drive A or B. It is necessary only to enter the command Park or Park C; after the system prompt appears on your display screen.

A>PARK or A>PARK C: (RETURN)

- b. The system will respond to this command by issuing a system response similar to the one listed below.

Hard disk locked at cylinder***

1. Before you begin to repack your PC System for its move, check and make sure that there are no diskettes loaded in your disk drives. The original shipping inserts that were loaded in the System Unit disk drives should be loaded into disk drives A and B. After the inserts have been loaded into the drives, lock the drives. A blank diskette can be used if you do not have a shipping insert to load into the drives.
2. Disconnect and remove all power and interface cables and connectors from the rear of the System Unit. Disconnect all electrical cables from the power source. Make sure that the power switch for the System Unit, monitor, and any other peripherals for your PC System are in the off position. Coil all power cables and connections and tape them to each unit.

2.7.1 SHORT DISTANCE MOVES

A short distance move usually does not require the packaging and transporting of the PC system to another location. A short distance move can consist of moving the PC system from one room to another or from one floor to another floor. When you are ready to move your PC System, move the components of the PC System separately. It would be advisable when moving your PC system to have other people around to help you.

2.7.2 LONG DISTANCE MOVES

1. When you unpacked your PC System in Chapter 1, we recommended that you save the shipping carton. You will need this carton to repack your System. If it is not possible to use the original, make sure that you use a suitable carton that can protect your PC System. Cushion each unit in the carton to prevent any damage during shipment.
2. Repacking the PC System
 - a. Reverse the steps taken in Chapter One to repack your PC System.

Figure 43 PC System Unit (1)
Preliminary

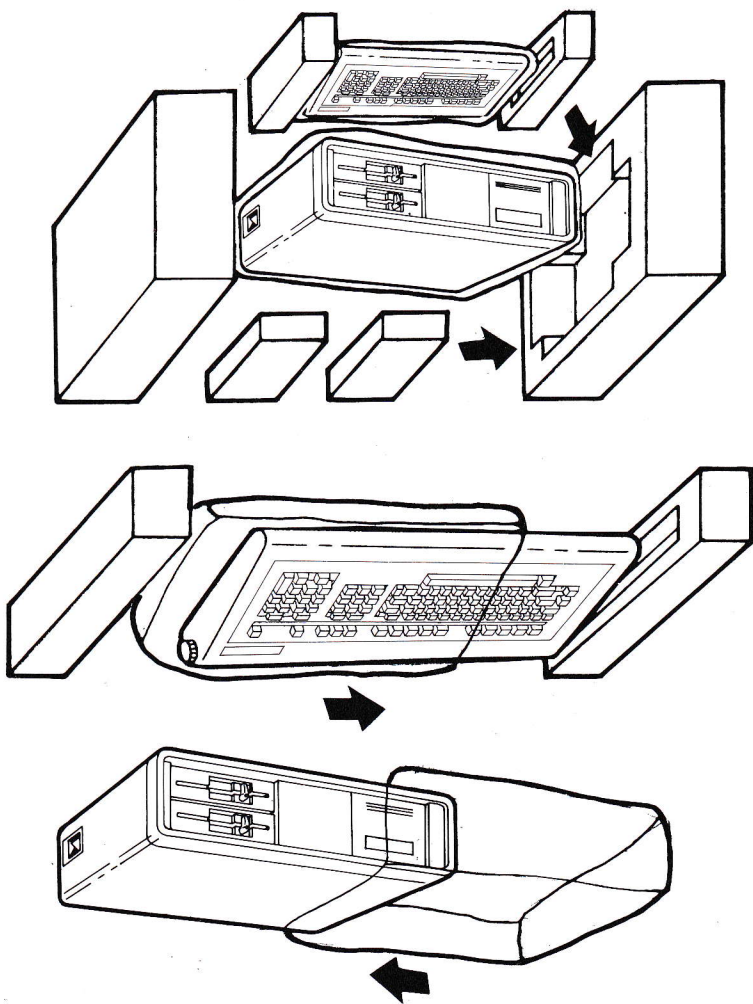


Figure 44 PC System Unit (2) Preliminary

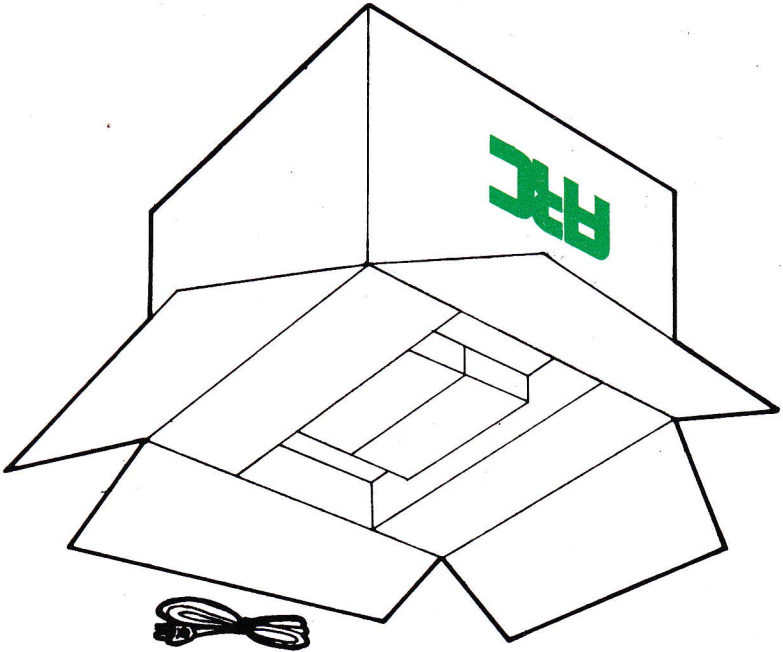
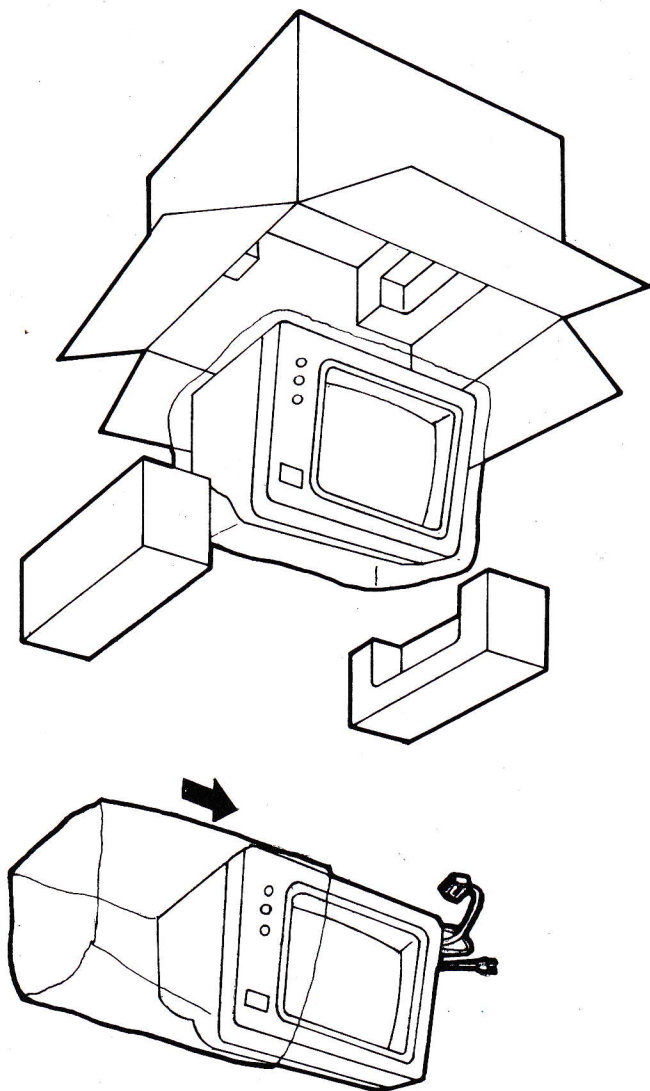


Figure 45 PC System Monitor
Preliminary



Notes

